Remarks

Claims 2 and 11 are canceled. Claims 1, 3-10 and 12-18 remain pending in the application and stand rejected. Claims 1, 10, 16 and 17 are amended in this Response. The Assignee respectfully traverses the rejection and requests allowance of claims 1, 3-10 and 12-18.

Claim Amendments

Claim 1 is amended to further provide "wherein the first optical signal and the second optical signal are aligned with the principal states of polarization of an optic fiber." Claim 10 is similarly amended.

Claims 2 and 11 are canceled, as their provisions have been incorporated into claims 1 and 10, respectively.

Claim 16 is amended to provide proper dependence from independent claim 10.

Claim 17 is amended to provide proper dependence from independent claim 10, and to repair three grammatical mistakes.

Claim Rejections Under 35 U.S.C. § 102

1. Buhrer

Claims 1, 2, 5, 6, 10, 11, 14 and 15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,435,229 to Buhrer (hereinafter "Buhrer"). The Assignee respectfully traverses the rejection.

Amended claim 1 currently provides a method "wherein the first optical signal and the second optical signal are aligned with the principal states of polarization of an optic fiber." The Office action indicates that this limitation, formerly provided by now-canceled claim 2, is disclosed in Buhrer. Page 3 of the Office action. The Assignee respectfully disagrees. Buhrer does not discuss optic fibers, and thus does not discuss principal states of polarization related to polarization mode dispersion of an optic fiber. Thus, this provision of claim 1 is not taught or suggested by Buhrer. Thus, the Assignee contends claim 1 is allowable for at least this reason, and such indication is respectfully requested.

Also, as claim 10 is currently amended to incorporate a similar provision, the Assignee asserts that claim 10 is also allowable for at least the same reasons provided above for claim 1,

and such indication is respectfully requested.

In addition, since claims 5 and 6 depend from independent claim 1, and claims 14 and 15 depend from independent claim 10, these claims are allowable for at least the reasons provided above in support their respective independent claims.

As mentioned above, claims 2 and 11 are canceled herein, as their provisions have been incorporated into their respective independent claims. Thus, the rejection as it pertains to claims 2 and 11 is rendered moot.

Therefore, the Assignee respectfully requests the rejection of claims 1, 2, 5, 6, 10, 11, 14 and 15 be withdrawn.

2. Shibutani

Claims 1, 7, 8 and 10 also stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,972,515 to Shibutani (hereinafter "Shibutani"). The Assignee respectfully traverses the rejection in light of the current amendments to claims 1 and 10.

More specifically, the provision from now-canceled claim 2 of a method "wherein the first optical signal and the second optical signal are aligned with the principal states of polarization of an optic fiber" is now provided by claim 1. Shibutani discloses first and second optical beams generated by a beam splitter 15, the beams being derived from an incident optical beam and a local oscillation beam combined by way of a directional coupler 13. Fig, 1; and column 5, lines 3-19. However, Shibutani does not discuss the first and second optical beams being aligned with the principal states of polarization of an optic fiber. Instead, the incident optical beam passes through the directional coupler 13 to couple the incident beam with the local oscillation beam. Fig. 1; and column 5, lines 3-7. Prior to the directional coupler, the polarization of the local oscillation beam is adjusted via the polarization adjuster 14 so that the local oscillation beam exhibits a common amplitude in each of the first and second optical beams. Fig. 1; and column 5, lines 15-19. From the directional coupler, the first and second lights beams impact first and second photodetectors 16 and 17, whereat the optical paths of the two beams terminate. Fig. 1; and column 5, lines 20-28. Shibutani does not indicate that the first and second optical beams are aligned with the principal states of polarization of an optic fiber, as no particular polarization of the incident optical beam is provided. Thus, Shibutani does not teach or suggest that particular provision of claim 1. Therefore, the Assignee asserts claim 1

is allowable for at least this reason, and such indication is respectfully requested.

Claim 10 is also currently amended to provide a similar limitation. Thus, the Assignee contends claim 10 is allowable for at least the same reasons given for claim 1, and such indication is respectfully requested.

Additionally, claims 7 and 8 depend from independent claim 1. Thus, the Assignee asserts claims 7 and 8 are allowable for at least the same reasons as those provided above with respect to claim 1.

Therefore, the Assignee respectfully requests the rejection of claims 1, 7, 8 and 10 be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

1. Lima and Way

Claims 1, 5, 9, 10, 14 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lima, A.O.; Lima, I.T., Jr.; Adali, T.; Menyuk, C.R.; PMD mitigation using diversity detection; Ultralong Haul DWDM Transmission and Networking/WDM Components, 2001 Digest of the LEOS Summer Topical Meetings, 30 July-1 Aug. 2001; pages 17-18 (hereinafter "Lima") in view of U.S. Patent Application Publication No. US 2002/0030877 A1 to Way et al. (hereinafter "Way"). The Assignee respectfully traverses the rejection in light of the current amendments to claims 1 and 10, which provide that "the first optical signal and the second optical signal are aligned with the principal states of polarization of an optic fiber."

Lima discloses a system for using diversity detection for mitigation of polarization mode dispersion. Page 17, columns 1 and 2. Lima addresses the problem by splitting the incoming optical signal into three separate beams, each of which is processed by a different type of polarization beam splitter, thereby producing three pairs of orthogonally polarized optical signals. Page 17, column 2 and Fig. 1(a). However, Lima does not indicate that any of these three beam splitters produces first and second optical signals which are aligned with the principal states of polarization. Thus, Lima does not teach or suggest that particular limitation of claim 1.

Way describes "a method and apparatus for combining interleaved optical single sidebands with a modulated optical carrier." However, Way does not discuss the existence of polarization mode dispersion, or the principal states of polarization thereto. Thus, Way also does not teach or suggest "the first optical signal and the second optical signal [being] aligned with the

principal states of polarization of an optic fiber," as provided for in claim 1.

Thus, the Assignee contends claim 1 is allowable over Lima and Way, and such indication is respectfully requested.

Further, since claim 10 now incorporates a similar provision, the Assignee asserts claim 10 is allowable for at least the same reasons as provided above for claim 1, and such indication is respectfully requested.

In addition, claims 5 and 9 depend from independent claim 1, and claims 14 and 18 depend from independent claim 10. Thus, the Assignee asserts claims 5, 9, 14 and 18 are allowable for at least the same reasons provided above for claims 1 and 10, and such indication is respectfully requested.

Given the foregoing discussion, the Assignee respectfully requests withdrawal of the rejection of claims 1, 5, 9, 10, 14 and 18.

2. Buhrer and Prior Art

Claims 1, 3, 4, 10, 12 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art in view of Buhrer. The Assignee respectfully traverses the rejection in view of the current amendments to claims 1 and 10.

As discussed above, Buhrer does not teach or disclose "the first optical signal and the second optical signal [being] aligned with the principal states of polarization of an optic fiber," as provided for in claim 1, because optic fibers, polarization mode dispersion, and the like are not contemplated therein.

Fig. 1 of the present application provides a block diagram which "depicts a PMD compensation system 100 in the prior art." Page 3, line 20. The compensation provides, in part, a polarization beam splitter 110 which "splits the optical signal by the PSPs [principal states of polarization] of the optical fiber into link 114 and the optical delay line 112." However, several other provisions of claim 1 are not provided by the PMD compensation system 100, as indicated on Page 6 of the Office action.

The Office action indicates that "it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply the signal detection method taught by Buhrer in the apparatus taught by the admitted prior art (fig. 1) in order to increase the reception sensitivity of optical signals using a polarization diversity receiving device." The Assignee

respectfully disagrees with this assertion. The elements of Buhrer applied in the Office action, such as the photodetectors 42 and 43, and the mixers 50 and 51, are employed in Buhrer to isolate and decode two independent information signals riding on subcarriers separated by 90 degrees of phase shift. Fig. 1; column 1, lines 14-23; and column 7, line 1, to column 8, line 56. In other words, Buhrer employs the photodetectors, mixers and other components to isolate the two information signals from the carrier, subcarriers and each other. Not contemplated in Buhrer is the presence of any kind of distortion, such as polarization mode dispersion. Thus, Buhrer does not provide any motivation to generate two optical signals aligned with the principal states of polarization of an optic fiber, especially since optic fiber is not discussed therein.

Similarly, Fig. 1 of the present application ameliorates polarization mode distortion by splitting the incoming optical beam according to the principal states of polarization, delaying one of the optical beams by the differential group delay associated with the principal states, and then combining the two optical beams before employing a single photodetector to transform the combined optical beam into a single electrical signal. Fig. 1; and page 3, lines 20-29. Thus, the PMD compensation system 100 of Fig. 1 of the present application represents a straightforward technique by which the resulting optical signal is predominantly restored to its pre-PMD state (i.e., as the optical signal left the transmitter) before being transformed into an electrical signal. Thus, no motivation exists to combine the photodetectors, mixers and related components employed by Buhrer, which separates two discrete information signals electrically, with the PMD compensation system 100 of Fig. 1, which mitigates PMD in the optical beam prior to being transformed into an electrical signal.

Given the foregoing, the Assignee asserts that claim 1 is not taught or suggested by any combination of Buhrer and Fig. 1 of the present application. Thus, the Assignee contends claim 1 is allowable, and such indication is respectfully requested.

Further, since claim 10 incorporates similar limitations to claim 1, the Assignee contends that claim 10 is allowable for at least the same reasons provided above, and such indication is respectfully requested.

In addition, since claims 3 and 4 depend from independent claim 1, and claims 12 and 13 depend from independent claim 10, these claims should be allowable for at least the reasons provided for their respective independent claims, and such indication is respectfully requested.

Therefore, the Assignee respectfully requests that the rejection of claims 1, 3, 4, 10, 12

and 13 be withdrawn.

3. Buhrer and Shibutani

Claims 16 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Buhrer in view of Shibutani. The Assignee respectfully traverses the rejection in view of the current amendments to claims 1 and 10, as well as the foregoing arguments.

More specifically, since claims 16 and 17 depend from claim 10, and claim 10 has been shown via the previous discussions of claim 1 to be allowable in view of the references cited in the Office action, the Assignee asserts claims 16 and 17 are allowable for at least those same reasons, and respectfully requests such indication.

Therefore, the Assignee respectfully requests withdrawal of the rejection of claims 16 and 17.

Conclusion

The prior art made of record and not relied upon (i.e., U.S. Patent No. 5,138,476 to Shibutani) has been reviewed and is not considered to teach or suggest the current invention as claimed.

Based on the above remarks, the Assignee submits that claims 1, 3-10 and 12-18 are allowable. Additional reasons in support of patentability may exist, but such reasons are omitted in the interests of clarity and brevity. The Assignee thus respectfully requests allowance of claims 1, 3-10 and 12-18.

The Assignee believes no additional fees are due with respect to this filing. However, should the Office determine additional fees are necessary, the Office is hereby authorized to charge Deposit Account No. 21-0765.

Respectfully submitted,

Date: 2/1/05

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